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Master Thesis

Topic: Concept study for hybrid optical and RF inter-satellite links on CubeSats

Short Description:

Free Space Optical (FSO) communication systems not only overcome the bandwidth limitations of RF systems, but also offer improved power efficiency, security and size compared to their traditional counterparts. These characteristics are of very high interest for small satellites, which are an increasingly growing market. The Optical Communication Systems Group at the Institute of Communications and Navigation has been developing an optical communication payload for CubeSats, with the primary goal of demonstrating high speed optical downlinks between a CubeSat and Earth.

This master thesis is about a concept to extend the optical communication payload for CubeSats for inter-satellite-links (ISLs). This thesis shall evaluate the necessary technical extensions for extending the optical communication payload towards ISLs. Furthermore, it shall estimate performance figures, such as achievable data rates and develop the procedures for the link acquisition between two satellites via laser-link. Additionally, a combined concept of optical and RF communications shall be investigated.

Details:

- Duration: 6 months
- Start: Now
- Requirements
 - Study of Space System Engineering, System Engineering or similar
 - Basic knowledge of optical system design
 - Interest in space technology
 - Experience in optical and RF communication would be preferred
- Supervisor: Roland Haber, Benjamin Rödiger

If you have any questions concerning specific aspects of the thesis, please contact **Roland Haber** (roland.haber@telematik-zentrum.de) or **Benjamin Rödiger** (Benjamin.Roediger@dlr.de)



Deutsches Zentrum
für Luft- und Raumfahrt
German Aerospace Center

